A taxonomic revision of *Dissiliaria* F.Muell. ex Baill. (Euphorbiaceae)

Paul I. Forster

Summary

Forster, Paul I. A taxonomic revision of *Dissiliaria* F.Muell. ex Baill. (Euphorbiaceae). *Austrobaileya* 5(1): 9–27 (1997). The genus *Dissiliaria* F.Muell. ex Baill. is revised. *Dissiliaria* is endemic to Australia with six species from eastern Queensland, *D. baloghioides* F.Muell. ex Baill., *D. indistincta* P.I.Forst. sp. nov., *D. laxinervis* Airy Shaw, *D. muelleri* Baill., *D. surculosa* P.I.Forst. sp. nov. and *D. tuckeri* P.I.Forst. sp.nov. All species are described and illustrated, with notes on distribution, habitat, typification and conservation status. The names *D. baloghioides* and *D. muelleri* are lectotypified.

Keywords: Euphorbiaceae, *Dissiliaria* - Australia; *Dissiliaria baloghioides, Dissiliaria indistincta, Dissiliaria laxinervis, Dissiliaria muelleri, Dissiliaria surculosa, Dissiliaria tuckeri.*

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Introduction

The genus *Dissiliaria* was described by Baillon (1867) who recognised two species *D. baloghioides* F.Muell. ex Baill. and *D. muelleri* Baill. Baillon provided descriptions and cited types for the two species he named, but did not provide a formal generic description of his genus although he did extensively discuss its affinities and morphological characters. Airy Shaw (1981) considered that Baillon's account did not constitute formal description; however, other authors (e.g. Bentham 1873; Chapman 1991; Webster 1994) and the compilers of Index Kewensis all considered it to be valid. A third species, *D. laxinervis,* was described by Airy Shaw (1980).

Dissiliaria was included both by Webster (1994) and Levin & Simpson (1994) in Euphorbiaceae subfamily Oldfieldioideae Köhler & Webster, tribe Caletieae Muell.Arg., subtribe Dissiliariinae Pax & K.Hoffm. Other genera included in subtribe Dissiliariinae are *Austrobuxus* Miq., *Canaca* Guillaumin (included with a query in *Austrobuxus* by Levin & Simpson (1994)), *Choriceras* Baill., *Longetia* Baill. ex Muell.Arg., *Sankowskya* P.I.Forst. and *Whyanbeelia* Airy Shaw & B.Hyland (Levin & Simpson 1994; Webster 1994; Forster 1995). A comparison of macromorphological characters for genera in the Dissiliariinae, together with a generic key may be found in Forster (1995). The genus *Dissiliaria* is characterised by the plants being dioecious and stipulate; the male flowers having 3+3 sepals, a hairy receptacle, glandular disk absent, 8–26 stamens, anthers oblong, pollen spiny and pistillode absent; the female flowers having 3+3 sepals, a glandular disk present and the styles linear in outline; the fruit globose and having laterally compressed seeds that have an entire caruncle. Anatomical features that distinguish species of *Dissiliaria* from other taxa in the Dissiliariinae according to Hayden (1994) are "high rank venation, well-developed and somewhat oriented areoles, narrow ultimate tracheids in veinlets, fimbrial veins, wavy anticlinal walls of leaf epidermis cells, bundle sheath extensions, and libriform wood fibres". Based on palynological, vegetative and anatomical characters, Levin & Simpson (1994: 226) produced a cladogram wherein *Dissiliaria* was basal in the Dissiliariinae, and more closely allied to *Austrobuxus* and *Whyanbeelia* than to *Longetia* and *Choriceras.*

All the species of *Dissiliaria* are trees and grow in rainforest communities. Fertile specimens of *Dissiliaria* have proven extremely difficult to acquire as flowering and fruiting is irregular and some of the localities where the

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Accepted for publication 16 May 1997

plants occur are difficult to access when they are fertile. This situation was alluded to by Airy Shaw (1981). Nevertheless, there is now considerably more material to review than was available to Airy Shaw. Consequently it is possible to resolve the status of specimens originating from the populations in the McIlwraith Range on Cape York Peninsula that Airy Shaw referred with doubt to *D. muelleri*. These are described as the new species *D. surculosa*. Airy Shaw also included a number of taxa within his concept of *D. laxinervis*. It is now possible to distinguish a further two new species allied to *D. laxinervis* in the strict sense with *D. indistincta* and *D. tuckeri* newly described in this paper. Hence, six species of *Dissiliaria* are recognised in the present account.

The species of *Dissiliaria* readily fall into two groups based on the morphological characters of leaf margin (entire or crenate) and fruits (strongly or weakly trilobate). Crenate leaves and strongly trilobate fruits occur in *D. muelleri* and *D. surculosa* P.I.Forst. Entire leaves and weakly trilobate fruits occur in the remaining species. The occurrence of crenate leaves is considered plesiomorphic and occurs in unrelated taxa in the Oldfieldioideae, although with a preponderance in the Dissiliariinae (Hayden 1994).

The different species of *Dissiliaria* occur in restricted and relictual populations with numerous disjunctions over some 15 degrees of latitude in eastern Queensland. This indicates that the extant species are relatively ancient with distributions fragmented by unfavourable environmental conditions at some time in the past, resulting in their being restricted in present times to refugial niches. Patterns of dispersal are unstudied in detail, but all species exhibit septicidal dehiscence of the capsular fruits followed by ‘drop and roll’ dispersal of the laterally compressed seeds. It is common to see profuse seedling beds beneath large female trees indicating that little lateral movement of seed occurs. In some instances, populations may be found for considerable distances along creeks on alluvia, indicating secondary water transportation of seeds occurs.

Materials and methods

This revision is based on herbarium holdings at BRI, CANB, CBG, NSW, MEL and QRS, photographs of material in BM, G-DC, K and P, and field collections and observations by the author. All specimens have been seen unless indicated n.v. Indumentum cover is described using the terminology of Hewson (1988), except that ‘scattered’ is preferred to ‘isolated’. Indumentum in *Dissiliaria* uniformly comprises simple, multicellular trichomes, thus reinforcing the observations of Hayden (1994) and further refuting those of Rao & Raju (1985).

Conservation codings are allocated using the terminology as defined in the schedules of the Queensland Nature Conservation Act 1992. Rainforest classification follows the scheme proposed by Webb (1978). The ‘Wet Tropics’ is defined as the area of north-eastern Queensland that encompasses the ‘hot, humid vine forests’ from near Cooktown in the north to Paluma in the south (Webb & Tracey 1981; Barlow & Hyland 1988).

Taxonomy

Dissiliaria F.Muell. ex Baill., Adansonia 7: 366 (1867). **Type:** *D. baloghioides* F.Muell. ex Baill. lecto, *fide* Webster (1994: 58).

Derivation of name: from the Latin *dissilio* (to fly apart) and - *aria* (resembling or provided with), alluding to the dehiscence of the fruit capsule.

Trees, evergreen, perennial, dioecious; stems and foliage without latex. Indumentum of simple, multicellular trichomes; glandular trichomes absent; stinging trichomes absent. Stipules entire, inconspicuous or conspicuous, deciduous. Leaves opposite, petiolate, elobate, penninerved; margins entire or crenate. Inflorescences axillary, racemose, solitary or fascicled, unisexual with flowers in bracteate clusters. Male flowers pedicellate; sepals imbricate, 3+3; petals absent; receptacle convex; disk absent; stamens 8–26; filaments free, filiform to flattened-filiform, attached to slightly convex receptacle; anthers dorsifixed, bilobate; thecae oblong and longitudinally dehiscent; pistillode absent. Female flowers pedicellate; sepals imbricate, 3+3; petals absent; disk shortly annular or cupular; ovary 2 - or 3-locular; locules biovulate; styles 3, erect, linear-subulate, entire, shortly connate at base. Fruit capsular, trilobate, with surface smooth to muriculate, dehiscing septicidally into 3 bivalved cocci. Seeds semi-elliptic in outline, laterally compressed; testa crustaceous; albumen fleshy; caruncle entire, non-arilloid; cotyledons broad, flat.

Six species endemic in Australia.

Key to species of *Dissiliaria*

1. Leaves chartaceous, < 9.5 cm long, crenate 2
   Leaves coriaceous, 9.5–18 cm long, entire 3

2. Leaf lamina narrowly elliptic with 17–23 marginal teeth per side of the midrib; tip acuminate; male flower sepals obovate, 0.8–1.2 mm wide . . . . **6. D. surculosa**
   Leaf lamina broadly ovate to rhombic-ovate with 14–16 marginal teeth per side of the midrib; tip acute, obtuse or retuse; male flower sepals broadly elliptic, 1.4–1.5 mm wide . . . . **5. D. muelleri**

3. Stipules lanceolate-obovate; stipular scar 1.8–2.2 mm wide . . . . **4. D. tuckeri**
   Stipules linear or deltoid-lanceolate; stipular scar 0.5–0.8 mm wide 4

4. Stipules linear, c. 4 mm long; interlateral venation prominent below with all connecting veins raised; pedicels 2.5–9 mm long . . . . **1. D. baloghioides**
   Stipules deltoid-lanceolate, 1–1.5 mm long; interlateral venation weakly visible below with only the outer connecting veins raised; female pedicels 10–40 mm long 5

5. New foliage green to pale green-pink; styles c. 6 mm long, erect, connate for 2–2.5 mm; stamens 22–26; anthers 1.3–1.7 mm long . . . . . . **2. D. laxinervis**
   New foliage bright pink-brown; styles 2.5–4mm long, strongly recurved, connate for c. 1 mm; stamens 16–18; anthers 0.8–1.2 mm long . . . . **3. D. indistincta**

1. Dissiliaria baloghioides F.Muell. ex Baill., Adansonia 7: 366 (1867). **Type:** Queensland. Moreton District: [label in Leichhardt's hand] "scrub towards the Bunyas, 18/9/1843"; [printed label] Moreton Bay; [label in Leichhardt's hand] "Wood 14....the blackfellows make their boomerangs of it"; [label in unknown hand] "n.328h. Leichhardt Moreton Bay" (lecto [here designated]: P *n.v.*, photo at BRI).

Illustrations: Francis (1981: 131, 132); Hauser (1992: 216).

Tree to 36 m high. Trunk slightly flanged at base. Bark rough, flaky-scaly in patches, grey to grey-brown; blaze pink. Branchlets ± rounded, glabrous or with only scattered trichomes when young, lenticellate with age. Stipules linear, c. 4 mm long and 0.7 mm wide, with scattered trichomes. Leaves glabrous; new foliage pale pink; petioles 4–10 mm long, 0.8–1 mm wide, glabrous; laminas ovate, obovate or elliptic, 50–120 mm long, 15–70 mm wide, coriaceous, with margins entire and venation composed of 8 or 9 lateral veins per side of midrib and interlateral reticulate tertiary veins; upper surface shining dark green with venation ± obscure; below glossy pale green with venation prominent with all interlaterals raised; tip acute to obtuse; base attenuate, obtuse or truncate. Male inflorescences in distal axils, up to 7 mm long; peduncles up to 1 mm long; bracts lanceolate, 1–1.5 mm long, 0.4–1.2 mm wide. Male flowers with pedicels 4–12 mm long, 0.5– 0.9 mm diameter, with sparse to dense golden trichomes; sepals elliptic, 1.8–4.5 mm long, 1.2–2 mm wide, with sparse trichomes; disk 2–2.5 mm diameter, with dense trichomes; stamens 15–20; filaments1.5–3.1 mm long; anthers 0.5–1 mm long, 0.3–0.7 mm wide. Female inflorescences in distal axils, of solitary flowers with peduncles obsolete; bracts ovate, c. 2 mm long and 1 mm wide, with sparse trichomes. Female flowers with pedicels 2.5–9 mm long, 1.2–2 mm diameter, with dense golden trichomes; sepals elliptic to ovate, 3–4 mm long, 1.8–2.2 mm wide, with sparse to dense trichomes; ovary 2.5–3 mm diameter, with dense golden trichomes; styles 2.6–3.5 mm long, shortly connate for c. 1 mm in length, strongly recurved, papillose on upper surface, with dense trichomes on lower surface for entire length. Fruits globose, weakly trilobate, 12–21 mm long, 15–22 mm diameter, minutely muriculate; seeds 8–10 mm long, 4.5–5.5 mm wide, 2–2.4 mm thick, smooth, shiny brown. Fig. 1.

***Selected additional specimens examined*: Queensland.** North Kennedy District: Slaty Creek, near Proserpine, *Michael* 988 (BRI). South Kennedy District: Cherrytree Creek, Koumala, Nov 1987, *Canning* 305 (BRI); Foot of ranges W from Koumala, May 1921,*Francis* [AQ202261] (BRI). Port Curtis District: Pine Creek, off lower reaches of Granite Creek, S.F. 391 Bulburin, 24°37'S, 151°33'E, Dec 1993, *Forster* 14580 et al. (BRI); S.F. 67, Bulburin, Sep 1983, *Gibson* 559 (BRI); Crossing Reserve R73 Miriam Vale, on Baffle Creek, 5 km E of Miriam Vale on road to Agnes Water, Jul 1978,*McDonald* 2347 *& Stanton* (BRI, CANB). Wide Bay District: Amamoor, May 1918, *Forestry Dept.* [AQ202271] (BRI); S.F. 50, 3.5 km S of Mt Urah, 25°52'S, 152°22'E, Nov 1988, *Forster* 4842 (BRI, CANB, MEL); S.F. 50 Glenbar, 1 km WSW of Mt Urah summit, 25°50'S, 152°20'E, Jan 1993, *Forster* 13126A *& Machin* (A, BRI, K, L, MEL, QRS), 13126B (BRI, K, L, MEL, QRS); Kin Kin, Eastern Branch road, 26°18'S, 152°53'E, Feb 1995,*Forster* 16123A (BRI, MEL, NSW, QRS). Moreton District: Bahr's Scrub, S of Beenleigh, 27°43'S, 153°10'E, Jun 1983, *Guymer* 1857 (BRI, CANB, MEL); 7 km SE of Mt Nebo, Scrub Road, Brisbane Forest Park, 27°25'S, 152°50'E, Sep 1993, *Halford* Q1842 (BRI); Petrie Creek, West Woombye, 26°40'S, 152°57'E, Apr 1986, *Sharpe* 4324 & *Guymer* (BRI); Eumundi, May 1896,*Simmonds* 470 (BRI); Kelvin Grove, Sep 1920, *White & Francis* [AQ202263] (BRI); Highvale near Samford, 27°22'S, 152°49'E, Dec 1983, *Williams* 83091 (BRI).

***Distribution and habitat*:** *D. baloghioides* occurs in the North Kennedy, South Kennedy, Port Curtis, Wide Bay and Moreton districts of Queensland in disjunct populations (Map 1). This species is more widely distributed than stated by Airy Shaw (1981), occurring from the Mt Dryander area in the north to near Brisbane in the south. Plants grow in notophyll vineforests on volcanic substrates derived from granite or rhyolite and are often locally abundant, particularly on creek alluvia.

***Notes*:** Baillon (1867) cited three elements in the protologue of *D. baloghioides*, namely "*Leichhardt*, n.13, n.14 (1843), Moreton Bay" and "*Fitzalan*, Pine River, Port Denison". I have not been able to locate the *Fitzalan* collection, but what appears to be part of the *Leichhardt* collections is extant at P. This P material has several labels attached, but has the necessary requirements of at least one of the cited numbers (n.14), the correct date (1843) and the correct locality (Moreton Bay). The Leichhardt collection (n.14) is thus selected as lectotype of the name.

Some collections of *D. indistincta* P.I.Forst. from Mt Dryander in the North Kennedy district have been misidentified in herbaria as*D. baloghioides*; however this latter species is easily distinguished by the indistinct interlateral venation in the lower leaf lamina as well as several other features (Table 1). *D. baloghioides* does occur at Mt Dryander but grows in drier communities on the western slopes of the mountain (M.C.Tucker, pers. comm. 1994), whereas *D. indistincta* is common along creeks to the south and south-east of its base.

***Phenology*:** Flowers February to June; fruits February to December.

***Conservation status*:** Widespread, but not common with several populations in conservation reserves (Forster et al. 1991). No conservation coding is thought necessary.

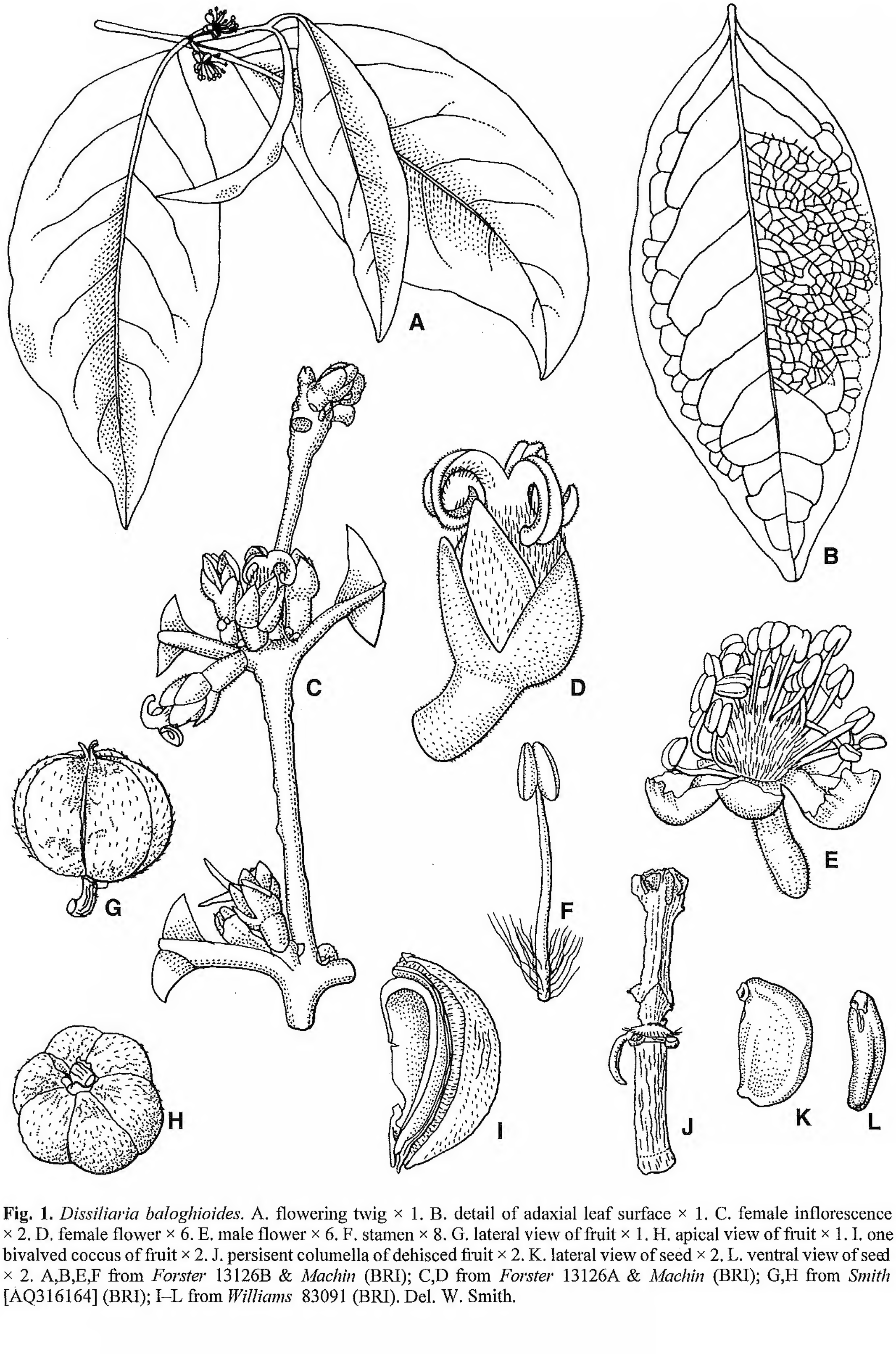


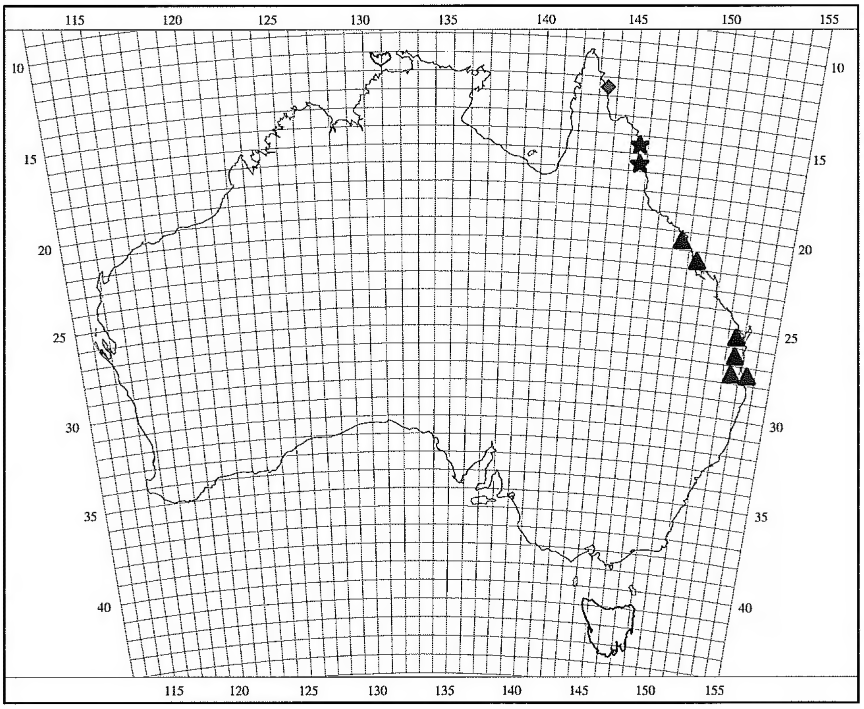
Fig. 1. *Dissiliaria baloghioides*. A. flowering twig × 1. B. detail of adaxial leaf surface × 1. C. female inflorescence × 2. D. female flower × 6. E. male flower × 6. F. stamen × 8. G. lateral view of fruit × 1. H. apical view of fruit × 1. I. one bivalved coccus of fruit × 2. J. persisent columella of dehisced fruit × 2. K. lateral view of seed × 2. L. ventral view of seed × 2. A,B,E,F from *Forster* 13126B & *Machin* (BRI); C,D from *Forster* 13126A & *Machin* (BRI); G,H from *Smith* [AQ316164] (BRI); I–L from *Williams* 83091 (BRI). Del. W. Smith.

Ethnobotanical use: *D. baloghioides* was reputedly used by aboriginal people in the Bunya Mountains area of south eastern Queensland to make boomerangs (label data with type). There are no extant populations of this species in the Bunya Mountains (cf. Forster et al. 1991) and it is likely that Leichhardt's specimens came from further east, in the Blackall Ranges that were also once referred to as the Bunya Mountains (R.Fensham, pers. comm. 1997).

Etymology: The specific epithet refers to a superficial similarity to what is now known as *Baloghia inophylla* (G. Forst.) P.S.Green.

2. Dissiliaria laxinervis Airy Shaw, Muelleria 4: 220 (1980). **Type:** Queensland. Cook District: Claudie River, 12°50'S, 143° 20'E, 29 Jun 1972, *B. Hyland* RFK2578 (holo: K n.v.; iso: BRI, QRS).

Tree to 30 m high. Trunk buttressed at base, not suckering; bark rough and flaky in patches, blaze red. Branchlets ± rounded, glabrous or with a few scattered trichomes when young, lenticellate with age. Stipules deltoid-lanceolate, 1–1.5 mm long, 0.5–0.6 mm wide, glabrous. Leaves glabrous; new foliage green or very slightly pale pink-green; petioles 7–9 mm long, c. 2 mm diameter, channelled on top, glabrous; lamina elliptic, 45–130 mm long, 30–70 mm wide, coriaceous, with margins entire and venation composed of 7 or 8 lateral veins per side of midrib and weakly developed interlateral reticulate tertiary veins; upper surface glossy dark green, with venation ± obscure; lower surface pale green, with venation weakly developed with only the outer interlateral veins raised; tip acute to obcordate; base cuneate to rounded. Male inflorescences in distal axils, ± sessile; bracts triangular, 1–1.2 mm long, c. 0.8 mm wide, glabrous; flowers in glomerules of 4–12. Male flowers with pedicels 22–30 mm long, c. 0.7 mm



Map 1. Distribution of ▲ *Dissiliaria baloghioides*, ◆ *D. laxinervis* and ★ *D. tuckeri*

diameter, glabrous or with scattered hairs; sepals lanceolate-obovate, 4–5 mm long, 2.8–3 mm wide, glabrous or with scattered hairs; disk 3–4 mm diameter, with scattered to sparse short trichomes; stamens 22–26; filaments 1.2–1.8 mm long, c. 0.1 mm diameter, glabrous; anthers 1.3–1.7 mm long, 0.9-1 mm wide. Female inflorescences in distal axils, of solitary flower with peduncle obsolete; bracts lanceolate, c. 1.5 mm long and 0.4 mm wide, glabrous. Female flowers with pedicels 17–40 mm long, c. 1 mm diameter, glabrous; sepals lanceolate, 2.8–4 mm long, 1.2–2.7 mm wide, glabrous; ovary globose, c. 2 mm long and 2 mm diameter, with dense yellow trichomes; styles c. 6 mm long, shortly connate for 2–2.5 mm at base, erect and with dense trichomes abaxially and shortly papillose apically. Fruits globose, weakly trilobate, 14–18 mm long, 15–18 mm diameter, minutely muriculate; seeds 8–10 mm long, 6.5–7 mm wide, 1.5–2.1 mm thick, smooth, shiny brown. Fig. 2.

Table 1. Comparison of morphological characteristics of entire-leaved species of *Dissiliaria*

Character	*D. baloghioides*	*D. laxinervis*	*D. tuckeri*	*D. indistincta*
no. of lateral veins per side of leaf lamina midrib	8 or 9	7 or 8	8–10	5–7
stipule shape	linear	deltoid-lanceolate	lanceolate-obovate	deltoid-lanceolate
stipule size (mm)	c. 4 × 0.7	1–1.5 × 0.5–0.6	2.2–4 × 1.8–2.2	1–1.3 × 0.5–0.8
interlateral veins abaxially	prominent	indistinct	indistinct	indistinct
stamen number	15–20	22–26	?	16–18
style length (mm)	2.6–3.5	c. 6	4–4.5	2.5–4
styles	recurved	erect	recurved	recurved
styles connate at base	1 mm	2–2.5 mm	1 mm	0.8–1 mm
female flower pedicel length (mm)	2.5–9	17–40	15–33	10–30
new foliage	pale pink	green or very bright red-pink	bright pale green-pink	pink-brown
petiole dimensions (mm)	4–10 × 0.8–1	7–9 × c. 2	4–8 ×1.5–2.5	3–7 × 1–2

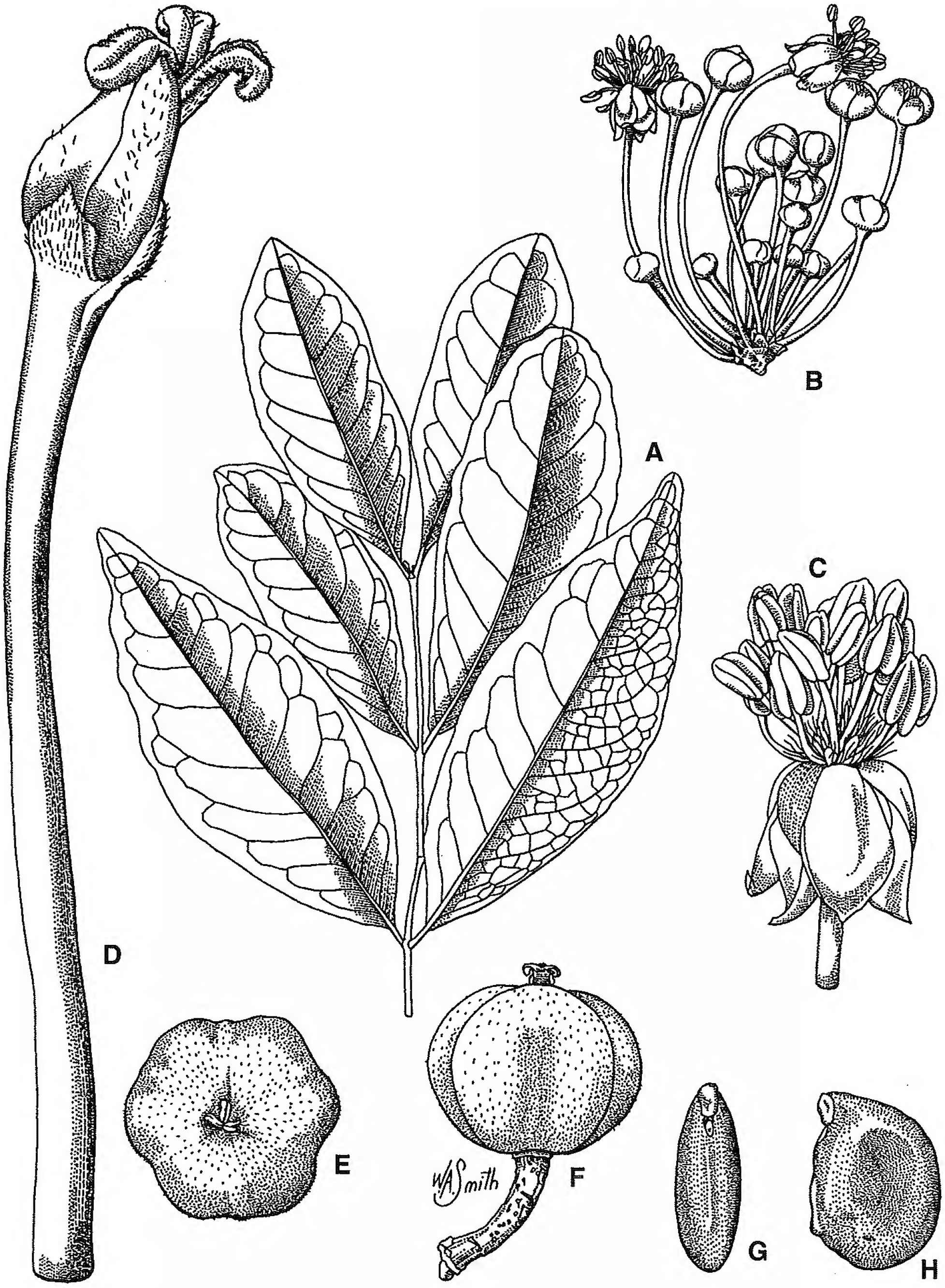


Fig. 2. *Dissiliaria laxinervis.* A. twig × 0.4. B. male inflorescence × 1.5. C. male flower × 5. D. female flower × 5. E. apical view of fruit × 1.5. F. lateral view of fruit × 1.5. G. ventral view of seed × 2.5. H. lateral view of seed × 2.5. A from *Forster* 13560 (BRI); B,C from *Sankowsky* 871 (QRS); D from *Hyland* 11516 (QRS); E–H from *Gray* 3626 (QRS). Del. W. Smith.

Selected additional specimens examined**: Queensland.** COOK DISTRICT: Iron Range, 12°46'S, 143°17'E, May 1992, *Cooper & Cooper* 283 (QRS); Claudie River, 4 km ENE of Mt Tozer, Iron Range N.P., 12°44'S, 143°15'E, May 1992, *Fell* 2553 (BRI, QRS); Range 10 miles [16 km] NE of Iron Range, Apr 1944, *Flecker* N.Q.N.C.8689 (BRI, QRS); West Claudie River Scrub, 12°44'S, 143°14'E, Jul 1993, *Forster* 13560 et al. (BRI, MEL); Claudie River, 12°44'S, 143°15'E, Oct 1984, *Gray* 3615, 3626 (QRS); Claudie River, Jan 1982, *Hyland* 11516 (QRS); Claudie River, 12°44'S, 143°14'E, Sep 1988, *Sankowsky* 871 (QRS), 872 (QRS).

Distribution and habitat**:** *D. laxinervis* is known from a number of populations in the Claudie River catchment to the west of Iron Range on Cape York Peninsula (Map 1). Plants grow along permanent watercourses in mesophyll vineforest on alluvium derived from granite substrates.

Notes**:** *D. laxinervis* was described by Airy Shaw (1980) based on fruiting material. There is still a dearth of fertile herbarium material for this taxon, although it is now possible to provide descriptions of both male and female flowers here. Airy Shaw included material from the 'Wet Tropics' (1981) and Mt Dryander (annotations at BRI) within his concept of *D. laxinervis*, although he did comment that the collections from Gap Creek in the 'Wet Tropics' may be different. *D. laxinervis* is considered to occur only at Iron Range on Cape York Peninsula, and the southern populations mentioned by Airy Shaw are described in this paper as *D. tuckeri* and *D. indistincta*. They are compared with *D. laxinervis* in Table 1.

Phenology**:** Flowers have been collected in September and January; and fruits from May to October.

Conservation status**:** With the narrower circumscription of *D. laxinervis* accepted here, the species is now confined to a single degree square area on Cape York Peninsula. *D. laxinervis* is extremely common in the Claudie River Scrub and many plants are present in Iron Range National Park. No conservation coding is warranted.

Etymology**:** The specific epithet is derived from the Latin *laxis* (lax) and *nervis* (nerve) and refers to the lax nervation in the leaf lamina of this species.

3. Dissiliaria indistincta P.I.Forst., **sp. nov.** affinis *D. laxinervi* Airy Shaw a qua frondescentia nova clara rosei-rubra, stylis brevioribus (2.5 – 4 mm longis) valde recurvatis et breviter connatis (per 0.8–1 mm), et floribus masculinis staminibus paucioribus (16 –18) et antheris brevioribus (0.8–1.3 mm longis) differt. **Typus:** Queensland. NORTH KENNEDY DISTRICT: Dryander Creek, left branch, base of Mt Dryander, 20°16'S, 148°34'E, 23 Feb 1994, *P.I. Forster* 14856 & *A.R. Bean* (holo: BRI [3 sheets + spirit]; iso: A, B, BISH, CANB, DNA, G, K, L, MEL, MO, NSW, P, QRS, SING, US).

Tree to 25 m high or occasionally a shrub. Trunk often multistemmed, not butressed, not suckering; bark rough and flaky in patches; blaze pink. Branchlets ± rounded, glabrous or with a few scattered trichomes when young, lenticellate with age. Stipules deltoid-lanceolate, 1–1.3 mm long, 0.5–0.8 mm wide, glabrous. Leaves glabrous, new foliage bright pink-brown; petioles 3–7 mm long, 1–2 mm wide, channelled on top, glabrous; lamina elliptic, oblanceolate, 30–130 mm long, 10–55 mm wide, coriaceous with margins entire and venation composed of 5–7 lateral veins per side of midrib and weakly developed interlateral reticulate tertiary veins where only the outer veins are raised; upper surface glossy dark green, venation ± obscure; lower surface pale green, venation weakly developed; tip acute to obtuse; base cuneate to rounded. Male inflorescences in distal axils, ± sessile; bracts lanceolate, c. 1.3 mm long and 0.8 mm wide, with scattered hairs; flowers in glomerules of 1–3. Male flowers with pedicels 9–21 mm long, c. 0.6 mm diameter, with scattered hairs; sepals broadly ovate to obovate, 2.8–3 mm long, 2–3 mm wide, glabrous; disk c. 2.5 mm diameter, with sparse to dense hairs; stamens 16–18; filaments 1.7–2.5 mm long, c. 0.2 diameter, glabrous; anthers 0.8–1.2 mm long, 0.8–1 mm wide. Female inflorescences in distal axils, of solitary flowers with peduncles obsolete; bracts lanceolate-triangular, 0.8–5 mm long, 0.6–2 mm wide, glabrous. Female flowers with pedicels 10–30 mm long, 0.7–1.2 mm diameter, glabrous; sepals

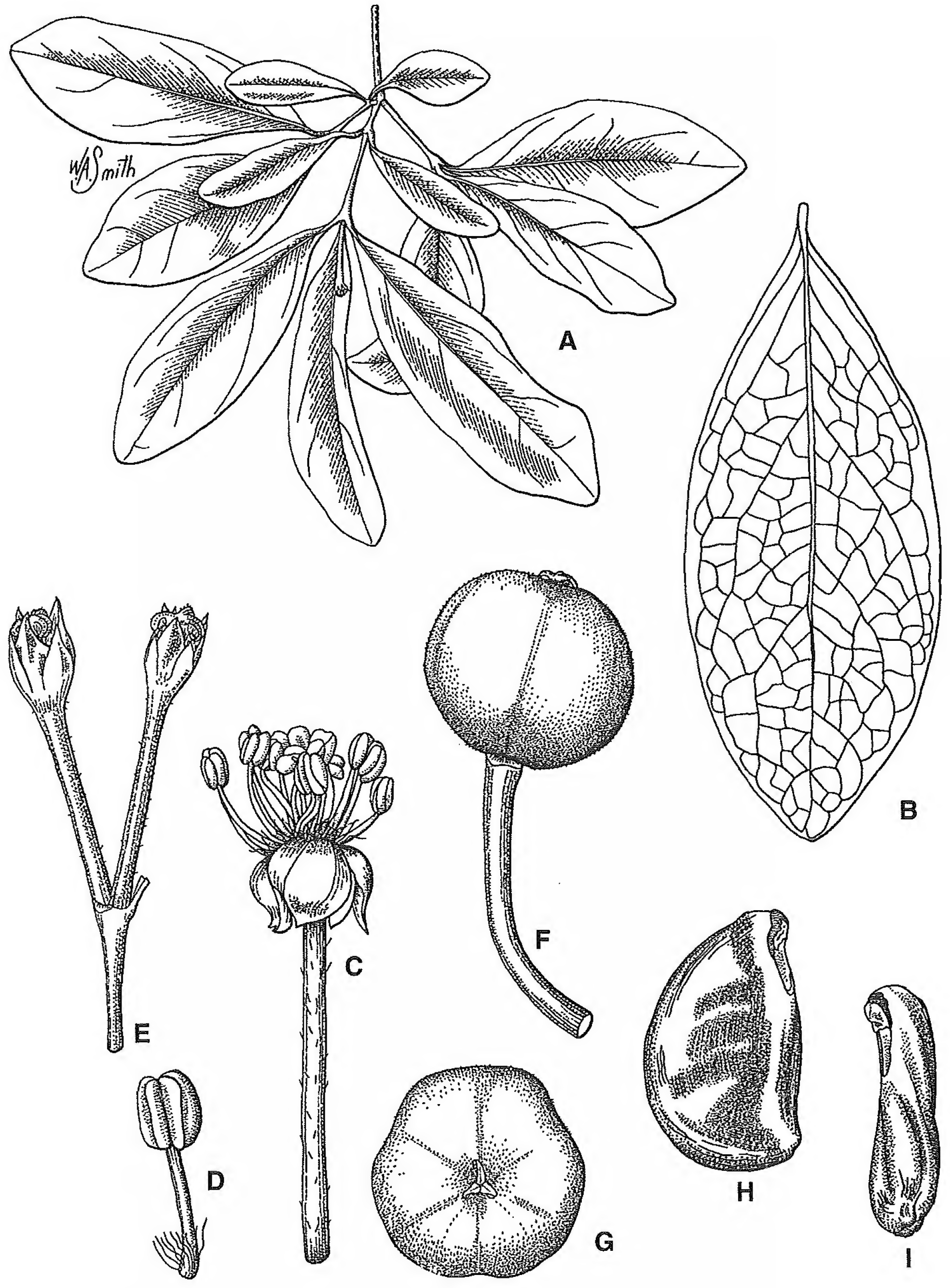


Fig. 3. *Dissiliaria indistincta.* A. flowering twig × 0.5. B. detail of adaxial leaf surface × 1. C. male flower × 5. D. stamen × 10. E. female inflorescence with two flowers × 2.5. F. lateral view of fruit × 2.5. G. apical view of fruit × 2.5. H. lateral view of seed × 10. I. ventral view of seed × 10. A, B, E from *Forster* 14856 & *Bean* (BRI); C, D from *Forster* 14857 & *Bean* (BRI), F, G from *Forster* 14302 (BRI); H, I from *Sharpe* 4175 (BRI). Del. W. Smith.

lanceolate to lanceolate - ovate, 1–5 mm long, 0.5–4 mm wide, glabrous or with scattered hairs at base; ovary subglobose, 3–4.5 mm long, 3–5 mm diameter, with dense golden trichomes; disk annular to irregular cupular, 0.4–2 mm long; styles 2.5–4 mm long, shortly connate for 0.8–1 mm at base, strongly recurved, papillose adaxially, with dense trichomes abaxially for entire length. Fruits subglobose, weakly trilobate, 12–16 mm long, 13–18 mm diameter, minutely muriculate; seeds 5–9 mm long, 3.5–6 mm wide, 1.5–2 mm thick, smooth, shiny brown. Fig. 3.

Selected additional specimens examined**: Queensland.** North Kennedy District: Hook Island, Nov 1985, *Batianoff* 3601A (BRI); Dugong Inlet, Whitsunday Island, 20°15'S, 148°57'E, Sep 1990, *Batianoff* 900973 & *Batianoff* (BRI); Walkers Creek, Mt Elliot, S of Townsville, 19°35'S, 146°59'E, Aug 1991, *Bean* 3617 (BRI); Station Hill, Cape Upstart Headland, 19°46'S, 147°49'E, Sep 1991, *Cumming* 11376 (BRI); Dryander Creek, left branch, SE slopes of Mt Dryander, 20°16'S, 148°35'E, Jun 1989, *Forster* 5128 & *Tucker* (BISH, BRI, MEL, MO); Dryander Creek, middle branch, SE base of Mt Dryander, 20°16'S, 148°35'E, Jun 1989, *Forster* 5175 & *Tucker* (BISH, BRI, DNA, K, QRS); Emmett Creek, Bowling Green Bay N.P., 19°27'S, 147°03'E, Dec 1993, *Forster* 14307 (BRI, MEL, QRS); ditto, Feb 1994, *Forster* 14883 & *Bean* (A, BRI, L, MEL, QRS); Cape Upstart, 19°42'S, 147°45'E, Oct 1985, *Melville* 592 (BRI); Dryander Creek, c. 2 km N of Gregory & c. 20 km N of Proserpine, 20°24'S, 148°35'E, Nov 1985, *Sharpe* 4175 (BRI); SE foothills of Mt Dryander, May 1969, *Smith* 14526 (BRI, CANB).

Distribution and habitat**:** *D. indistincta* is restricted to the North Kennedy district of Queensland where it occurs in three 1° grid cells between Townsville and Proserpine (Map 2). Plants grow on alluvium and talus along creeks in complex notophyll to mesophyll vineforests over granite substrates.

Notes**:** *D. indistincta* may be distinguished from all other species in the genus by the very poorly developed lateral venation in the leaves where only the intramarginal veins are raised on the lower leaf surface. *D. indistincta*, *D. tuckeri* and *D. laxinervis* are closely allied and superficially similar species (Table 1). *D. indistincta* differs from *D. tuckeri* in its smaller, deltoid-lanceolate stipules that leave a stipular scar 0.5–0.8 mm wide, greater number of lateral veins in the leaf lamina (8–10) that are also more poorly developed, and shorter styles (2.5–4 mm long). *D. indistincta* differs from *D. laxinervis* in the colour of its new foliage (bright pink-brown), generally shorter petioles, the shorter styles (2.5–4 mm long) that are strongly recurved and shortly connate (for 0.8–1 mm), and its male flowers with fewer stamens (16–18) and shorter anthers (0.8–1.3 mm long).

Phenology**:** Flowers February to June; fruits several months later. Flowering is extremely erratic and appears to be stimulated by heavy rainfall in the summer wet season.

Conservation status**:** *D. indistincta* is very common where it occurs and is known to be present in National Parks at Mt Elliot and Cape Upstart. No conservation coding is thought necessary.

Etymology**:** The specific epithet is derived from the Latin *indistinctus* (indistinct) and alludes to the poor development of lateral veins in the leaf lamina of this species.

4. Dissiliaria tuckeri P.I.Forst., **sp. nov.** affinis *D. laxinervi* Airy Shaw a qua frondescentia nova clara rosei-rubra, stipulis magnioribus lanceolati-obovatis (2.2–4 mm longis) cicatrice 1.8–2.2 mm lata, et stylis brevioribus (4–4.5 mm longis) valde recurvatis differt. **Typus:** Queensland. Cook District: Gap Creek, c. 22 miles [36.7 km] SE of Cooktown, May 1969, *L.S. Smith* 14419 (holo: BRI; iso: NSW).

Illustration**:** Christophel & Hyland (1993: 102, t. 40E); Cooper & Cooper (1994: 97) [as *D. laxinervis*].

Tree to 30 m high. Trunk buttressed at base, rarely multistemmed, not suckering; bark rough, flaky in patches, blaze pink. Branchlets ± rounded, glabrous or with a few sparse trichomes when young, lenticellate with age. Stipules lanceolate-obovate, 2.2–4 mm long, 1.8–2.2 mm wide, glabrous. Leaves glabrous, new foliage usually bright red-pink; petioles 4–8 mm long, 1.5–2.5 mm wide, channelled on top, glabrous; lamina elliptic, oblanceolate, 60–170 mm long, 30–75 mm wide, coriaceous, margins entire, venation composed of 8–10 lateral veins per side of midrib and weakly developed interlateral reticulate tertiary veins with only the outer veins raised; upper surface dark glossy green, venation weakly developed; lower surface matt light green, venation weakly developed; tip acute, acuminate, obtuse, rounded; base cuneate or rounded. Male inflorescences and flowers not seen. Female inflorescences in distal axils; female flowers 1 or 2 per axil with peduncles 2–4 mm long; bracts not seen. Female flowers (not seen at anthesis) with pedicels 15–33 mm long, glabrous; styles 4–4.5 mm long, connate for c. 1 mm at base, strongly recurved, papillose adaxially top and with sparse trichomes abaxially for entire length. Fruits subglobose, weakly trilobate, 13–15 mm long, c. 18 mm diameter, minutely muriculate; seeds c. 9 mm long, 7 mm wide and 1.5–2 mm thick, smooth, shiny brown. Fig. 4.

Selected additional specimens examined: **Queensland.** Cook District: Noah Creek, 3 km upstream from road, 16°08'S, 145°25'E, Aug 1987, *Christophel* [QRS 084689] (QRS); Gap Creek, Cedar Bay N.P., 15°49'S, 145°19'E, Jun 1992, *Forster* 10729 et al. (BRI); Little Cooper Creek, Daintree Freehold Rainforest, 16°10'S, 145°24'E, Jul 1994, *Forster* 15558 (BRI, QRS); Cape Tribulation N.P., Noah Creek, 16°08'S, 145°25'E, Sep 1991, *Gray* 5315 (QRS); 13.2 km S of Rossville on Bloomfield road, lowlands below Mt Finnegan, Dec 1989, *Jessup* GJD3086 et al. (BRI); Daintree, Nov 1959, *Manthey* 1777 (BRI); Gap Creek, 15°45'S, 145°10'E, May 1969, *Smith* 14372 (BRI); Bloomfield, 15°57'S, 145°20'E, May 1969, *Volck* 4290 (BRI); The Gap, between Rossville & Ayton, Jun 1973, *Webb & Tracey* 13709 (BRI).

***Distribution and habitat*:** *D. tuckeri* is known from several disjunct populations in two 1° grid squares in the 'Wet Tropics' of Cook district of north Queensland (Map 1). Plants grow in complex mesophyll vineforest on rocky alluvia derived from granite substrates along permanent watercourses.

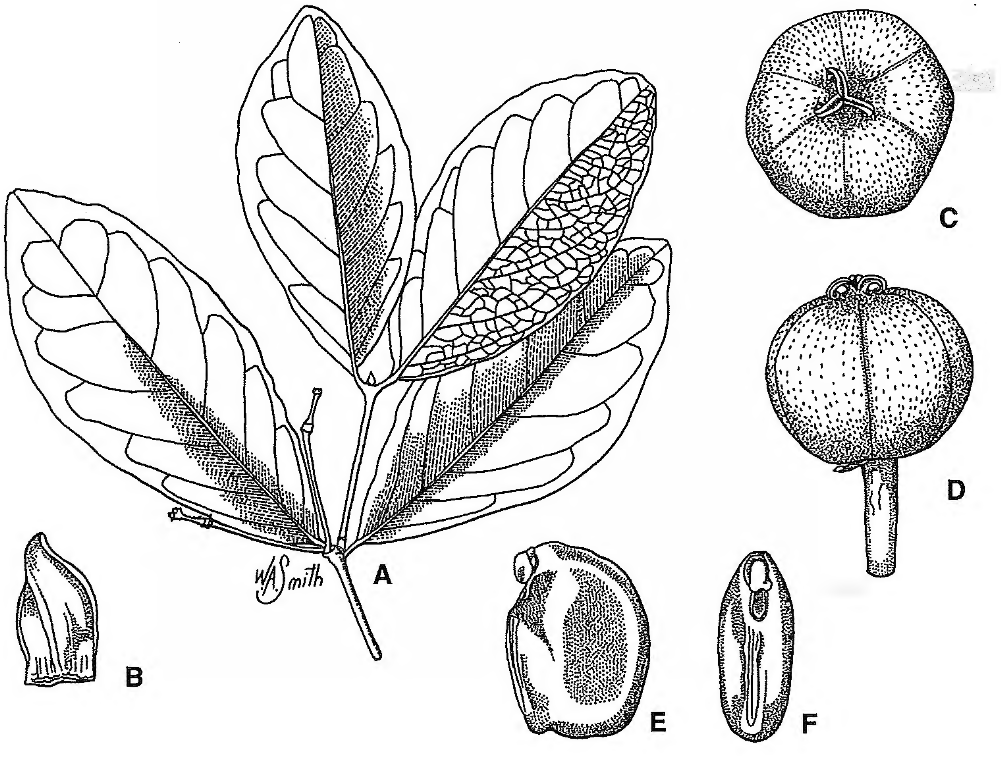


Fig. 4. *Dissiliaria tuckeri*. A. twig × 0.5. B. stipule × 5. C. apical view of fruit × 1.5. D. lateral view of fruit × 1.5. E. lateral view of seed × 2.5. F. ventral view of seed × 2.5. A,B from Smith 14419 (BRI); C–F from Gray 5315 (QRS). Del. W. Smith.

Notes: *D. tuckeri* is closely allied to *D. laxinervis* and the two species may be difficult to distinguish with incomplete herbarium material (see Table 1 for comparison). *D. laxinervis* has green to greenish pale pink new foliage; 1–1.5 mm long deltoid-lanceolate stipules that leave a scar 0.5–0.8 mm wide, generally shorter leaves (45–130 mm long), and longer styles (c. 6 mm long) that are held erect. *D. tuckeri* has bright pink-red new foliage; 2.2–4mm long lanceolate-obovate stipules that leave a scar 1.8–2.2 mm wide; generally longer (mainly oblanceolate) leaves (60–170 mm long) and shorter styles (4–4.5 mm long) that are strongly recurved. There also appear to be some differences in the seedlings of these two species (based on limited data). Seedlings of *D. tuckeri* have cotyledons that are more or less sessile and 22–23 mm long, whereas *D. laxinervis* has cotyledons that are shortly petiolate (c. 2 mm long) and 26–30 mm long.

The populations of *D. tuckeri* at the type locality of Gap Creek have much larger stipules than those from the Daintree area, but whether this is correlated with other morphological differences remains to be seen. There appear to be some differences in seedlings from the two areas (G. Sankowsky, pers. comm. 1994) but the evidence remains inconclusive at this stage. To determine whether or not *D. tuckeri* encompasses two taxa requires examination of fertile collections of male and female flowers! These have proved impossible to procure to date.

Conservation status: *D. tuckeri* is present in Cedar Bay National Park at the foothills of Mt Finnegan (Gap Creek) and in Cape Tribulation National Park at Noah Creek, but is still unreserved at Cooper Creek. The Cooper Creek population is under immediate threat due to residential development in one of the most diverse and species-rich areas of lowland rainforest north of the Daintree River. A conservation coding of 2VC as defined by the *Queensland Nature Conservation Act* 1992 is recommended.

Etymology: The specific epithet honours Maurie C. Tucker of Booval, Ipswich who has a keen interest in Australian rainforest plants and has explored many patches of rainforest and scrub with the author.

5. Dissiliaria muelleri Baill., Adansonia 7: 359 (1867). **Type:** Queensland. PORT CURTIS DISTRICT: Rockhampton, *Thozet* (lecto [here designated]: P. *n.v.*, photo at BRI).

Illustration: Baillon (1867: plate 1).

Tree to 10 m high. Trunk not buttressed, not suckering or only if damaged, but often multistemmed. Bark rough, flaky in patches, light to rich brown; blaze pink. Branchlets ± rounded, with short sparse trichomes when young, soon glabrescent and lenticellate with age. Stipules lanceolate, 0.8–1.4 mm long, 0.4–0.6 mm wide, glabrous or with scattered trichomes. Leaves glabrous; petioles 1–4 mm long, c. 0.5 mm wide; laminas broadly ovate to rhombic-ovate, 8–95 mm long, 6–65 mm wide, chartaceous, with prominent yellow venation comprising 7 to 9 laterals per side of midrib and weakly developed interlateral reticulate veins; upper surface glabrous, glossy green, venation ± obscure; lower surface glabrous, pale green, venation prominent; margins shallowly crenulate to subentire, with 14–16 teeth per side; tip acute, obtuse or retuse; base cuneate, obtuse, truncate. Male inflorescences 1–few-flowered in distal axils; peduncles 1–3 mm long, glabrous; bracts lanceolate to ovate, 1.4–2 mm long, 0.5–1.8 mm wide, glabrous. Male flowers with pedicels 2.5–7 mm long, c. 0.4 mm diameter, glabrous; sepals broadly elliptic, 1.5–2 mm long, 1.4–1.5 mm wide, glabrous or ciliate; receptacle c. 2 mm diameter, with sparse to dense trichomes and numerous small glands; stamens 8–16; filaments filiform, 0.9–1.8 mm long, c. 0.1 mm diameter; anthers 0.5–1 mm long, 0.3–0.8 mm wide. Female inflorescences (1-)–3-flowered, up to 15 mm long; peduncles 4–10 mm long, 0.7–0.8 mm diameter, glabrous; bracts lanceolate to oblanceolate, 0.8–1.5 mm long, 0.3–0.8 mm wide, glabrous. Female flowers with pedicels 1.5–10 mm long, 0.7–1.2 mm diameter, glabrous; sepals broadly elliptic to ovate, 1.8–7.5 mm long, 1.2–3 mm wide, glabrous; disk annular to cupular, surrounding the base of the ovary; ovary subglobose, 1.3–4 mm diameter, with sparse trichomes; styles very shortly connate, subulate, erect to slightly recurved, 2–3.2 mm long, with sparse trichomes at base. Fruits subglobose, strongly trilobate, 8–9 mm long, 10–15 mm diameter, with scattered to sparse trichomes, yellow-green. Seeds 4.8–5.5 mm long, 3.7–4.5 mm wide, 2–2.2 mm thick, smooth, shiny red-brown. Fig. 5.

***Selected additional specimens examined*:** **Queensland.** PORT CURTIS DISTRICT: Rockhampton, *Dallachy* [MEL 532391] (MEL); Mt Larcom, 23°48'S, 151°04'E, Jan 1988, *Forster* 3372 & *Gibson* (BRI, QRS); ditto, Jan 1994, *Forster* 14640 (BRI, MEL, QRS); Moores Creek E.P., Beserker Range, 23°19'S, 150°33'E, Jan 1993, *Forster* 12713 (BRI, L, MEL, QRS); Moores Creek, 23°20'S, 150°35'E, Oct 1976, *Hyland* 9084 (BRI, QRS); Archer Creek near Rockhampton, Jul 1935, *White* 12142 (BRI). WIDE BAY DISTRICT: Graphite Mine road, Guyra Range, Mt Bauple area, 25°47'S, 152°34'E, Dec 1992, *Forster* 12519A & *Smyrell* (BRI, K, L, MEL, QRS), 12519B (BRI, K, L, MEL, QRS); ditto, Jan 1994, *Forster* 14629 (BRI); c. 1 km N of Mt Bauple, 25°49'S, 152°35'E, Dec 1982, *Guymer* 1834 & *Dillewaard* (BRI); Mt Bauple, 27 miles [45 km] N from Gympie, Dec 1923, *Kajewski* [AQ202281] (BRI); Gundiah, Dec 1923, *Kajewski* [AQ202279] (BRI).

***Distribution and habitat*:** *D. muelleri* is known from three localities, Mt Archer near Rockhampton, Mt Larcom and Mt Bauple (Map 2), all in central and south-east Queensland (Forster et al. 1991). Plants grow in semi-evergreen microphyll vinethickets and araucarian microphyll vineforests on volcanic substrates of volcanic orgin.

***Notes*:** Baillon cited two syntypes for *D. muelleri*, *Thozet* 391 and *Dallachy* 429, both collected from the Rockhampton area. I have been able to locate unnumbered collections from the Rockhampton area of both these collectors in MEL and P. The Thozet collection at P is the better collection and hence is selected as lectotype of the name.

Sterile collections from the McIlwraith Range area in Cook district have been referred to this species in the past (e.g. Airy Shaw 1981); however, these belong to a distinct taxon named *D. surculosa* in this paper.

***Phenology*:** Flowers from December to January; fruits January to February.

***Conservation status*:** *D. muelleri* is a restricted endemic that is locally abundant in the three general localities where it occurs. Parts of two of these populations are in conservation reserves (Mt Bauple National Park & Mt Archer Conservation Park), but the Mt Larcom population is unreserved. No conservation coding is considered necessary at this stage.

6. Dissiliaria surculosa P.I.Forst., **sp. nov.** affinis *D. muelleri* Baill. a qua caulibus juvenibus dense lenticellatis, foliis anguste ellipticis et dentibus utroque latere 17–23 et apice acuminato, et sepalis florum marium obovatis et 0.8–1.2 mm latis differt. **Typus:** Queensland. COOK DISTRICT: Timber Reserve 14 Massy, 13°52'S, 143°23'E, 8 Nov 1980, *B. Hyland* 10882 (holo: QRS; iso: BRI).

Dissiliaria sp. RFK#2554 (Hyland & Whiffin 1993, 2: 132).

Dissiliaria sp. (Rocky River B.Hyland 10882) (Forster 1994).

***Illustration*:** Christophel & Hyland (1993: 102F).

Tree up to 13 m high. Trunk not buttressed, often suckering strongly from base. Bark brownish, with numerous dark brown pustulate lenticels; blaze pink. Branchlets ± rounded, with sparse trichomes when young, glabrescent, with dense lenticels even when young. Stipules lanceolate, 2–2.5 mm long, c. 0.7 mm wide, with sparse trichomes. Leaves with sparse trichomes when young, glabrescent, pale green; petioles 1.5–3 mm long, 0.5–0.8 mm diameter; laminas narrowly elliptic, 22–65 mm long, 7–27 mm wide, chartaceous, venation composed of 7 or 8 prominent lateral veins per side of midrib and interlateral reticulate tertiary veins; margins crenate with 17 to 23 teeth per side of midrib; upper surface glossy green, venation ± obscure; lower surface pale green, venation prominent; tip short to long acuminate; base cuneate. Male inflorescences 1–3 in distal axils with peduncles up to 2 mm long, with sparse trichomes; bracts lanceolate, 1–1.8 mm long, 0.3–0.4 mm wide, glabrous. Male flowers with pedicels 5–10 mm long, c. 0.3 mm diameter, with scattered trichomes at base; sepals obovate, 1.8–2.3 mm long, 0.8–1.2 mm wide, glabrous or with scattered trichomes and

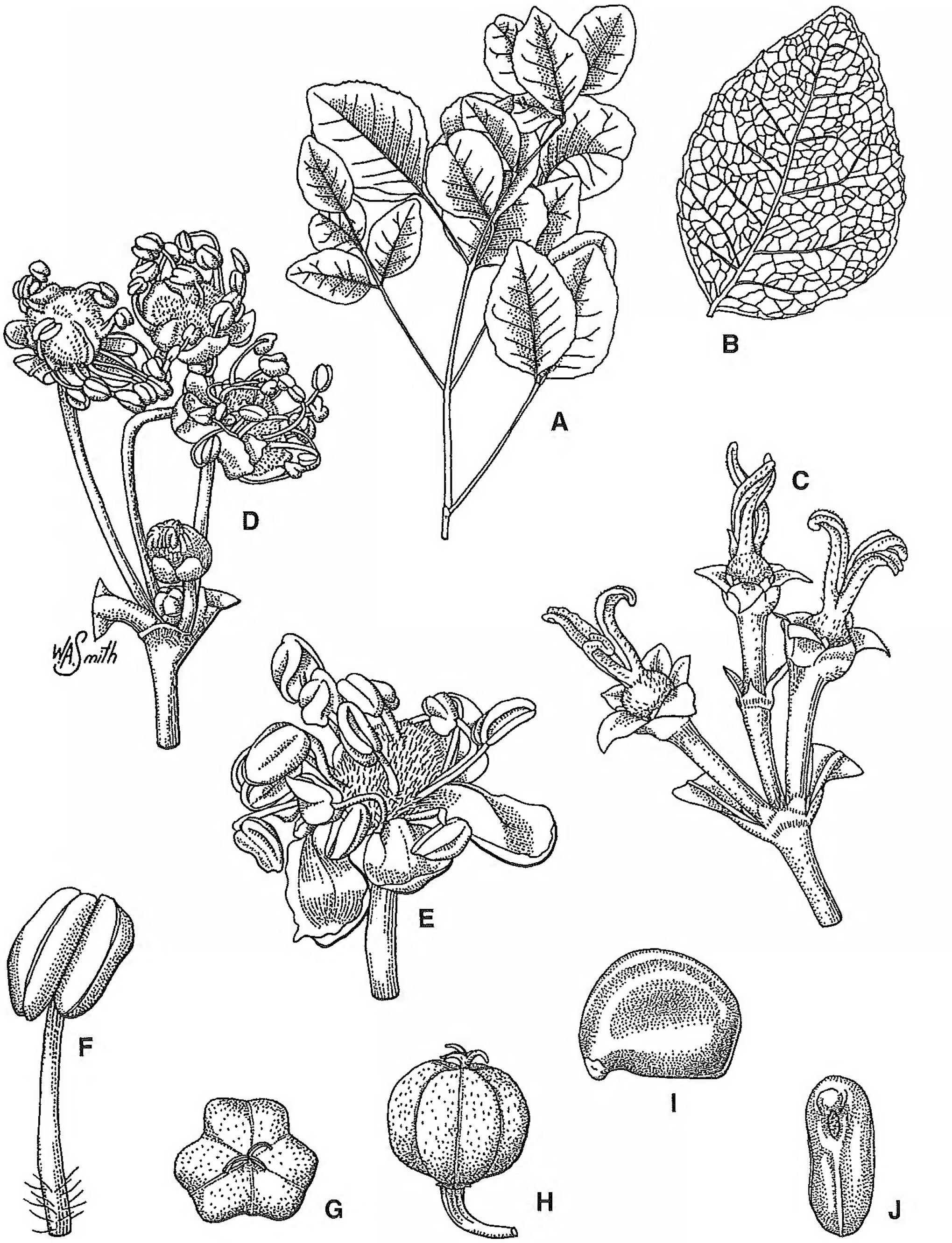
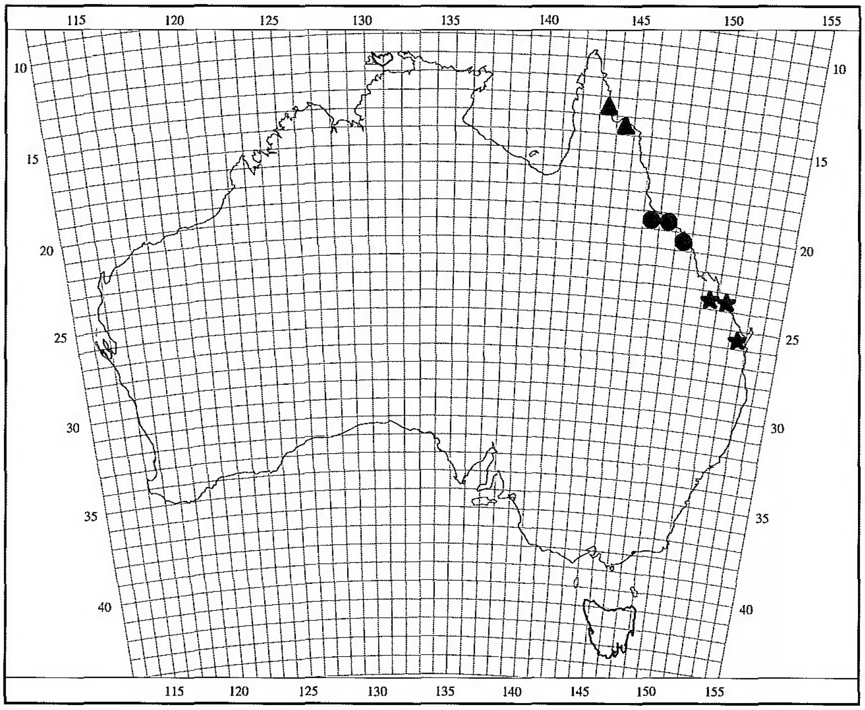


Fig. 5. *Dissiliaria muelleri*. A. twig × 1. B. detail of adaxial leaf surface × 2. C. female inflorescence × 8. D. male inflorescence × 8. E. male flower × 16. F. stamen × 32. G. apical view of fruit × 4. H. lateral view of fruit × 4. I. lateral view of seed × 8. J. ventral view of seed × 8. A,B from *Forster* 12519A & *Smyrell* (BRI); C from *Forster* 12713 (BRI); D–F from *Forster* 12519B & *Smyrell* (BRI); G,H from *Forster* 3372 & *Gibson* (BRI); I,J from *Forster* 14629 (BRI). Del. W. Smith.

marginal cilia; disk c. 1.6 mm diameter, with dense trichomes; stamens 16; filaments filiform, 1–1.4 mm long; anthers 0.8–1 mm long, 0.3–0.5 mm wide. Female inflorescences and flowers not seen. Fruit subglobose, strongly trilobate, 9–10 mm long, 11–12 mm diameter, ± glabrous. Seed not seen. Fig. 6.

Selected additional specimens examined**: Queensland.** Cook District: Temple Creek Catchment, Cape Melville N.P., 15 km NW of Barrow Point, 14°17'S, 144°31'E, Jul 1993, *Fell* 3331 et al. (BRI, CANB, DNA, MBA, MEL, QRS); Rocky River Scrub, Silver Plains Station, 13°48'S, 143°28'E, Jun 1992, *Forster* 10606 et al. (BRI, QRS); ditto, Jul 1993, *Forster* 13620 et al. (BRI, QRS); Upper Massey Creek, c. 15 miles [25 km] ENE of Coen, Oct 1962, *Smith* 11730 (BRI); McIlwraith Range, c. 11 miles [18.3 km] ENE of Coen, Oct 1962, *Smith* 11792 (BRI); Rocky River, eastern foothills of McIlwraith Range, 13°47'S, 143°25'E, Oct 1969, *Webb & Tracey* 9435 (BRI).

Distribution and habitat**:** *D. surculosa* is endemic in Cape York Peninsula where it is known from the eastern fall of the McIlwraith Range and Cape Melville (Map 2). At the McIlwraith Range, plants grow near watercourses in semideciduous notophyll to mesophyll vineforest on deep alluvia derived from metamorphic and granite substrates. This gallery-forest is usually flooded during the wet season and in July 1993, there was evidence of flood debris some 12 m above the ground in the crowns of the trees. Associated plants include *Castanospermum australe* A.Cunn. & Fraser ex Hook., *Ficus albipila* (Miq.) King, *Haplostichanthus* sp. (Rocky River Scrub P.I.Forster PIF10617), *Rhodamnia australis* A.J.Scott, *Pilidiostigma recurvum* (C.T.White) A.J.Scott, and *Codiaeum variegatum* var. *moluccanum* (Decne.) Muell.Arg. At Cape Melville, the plants grow in semi-deciduous



Map 2. Distribution of ● *Dissiliaria indistincta*, ▲ *D. surculosa* and ★ *D. muelleri*

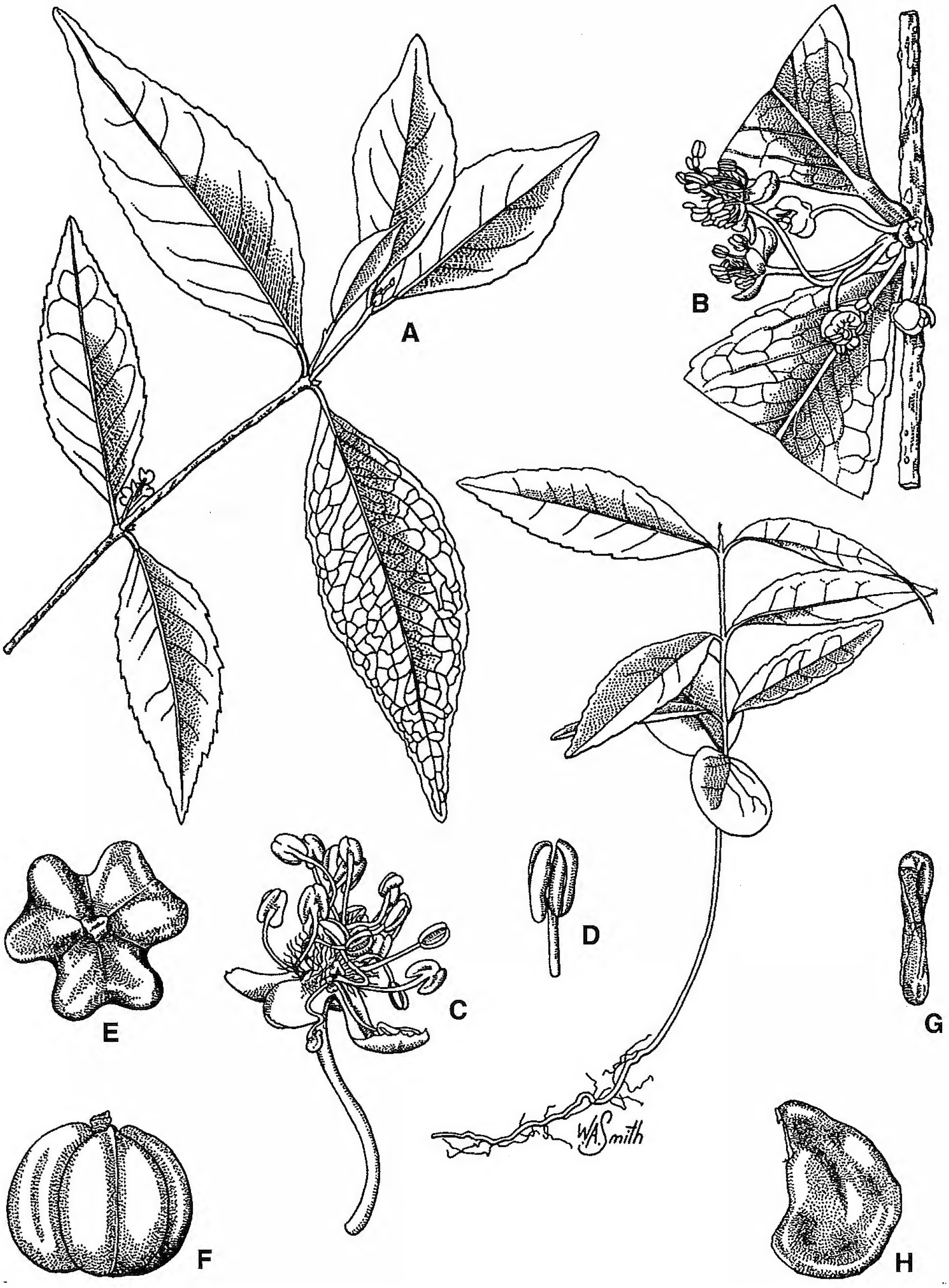


Fig. 6. *Dissiliaria surculosa.* A. twig. x 1. B. node with male inflorescence × 2.5. C. male flower × 5. D. stamen × 10. E. apical view of fruit × 2. F. lateral view of fruit × 2. G. ventral view of seed × 5. H. lateral view of seed × 5. I. seedling × 1. A–D from *Hyland* 10882 (BRI); E–I from *Forster* 13620 (BRI). Del. W. Smith.

notophyll to microphyll vinethicket on hillslopes on colluvium derived from granite. Associated canopy species at this locality include *Pongamia pinnata* (L.) Pierre and *Wodyetia bifurcata* Irvine.

Notes: *D. surculosa* appears to have been first collected by L.S.Smith in 1962. Sterile material of this plant was referred with doubt to *D. muelleri* by Airy Shaw (1981). *D. surculosa* strongly resembles *D. muelleri*, but differs in its narrowly elliptic leaf laminas with a short to long acuminate tip, the 17–23 marginal teeth per side of the midrib, the dense lenticels on young stems and the sepals of the male flowers being obovate and 0.8–1.2 mm wide.

Conservation status: *D. surculosa* is apparently restricted in its distribution. At present there appear to be no obvious threats to this plant and it is present in Cape Melville National Park. No conservation coding is thought necessary.

Etymology: The specific epithet is derived from the Latin *surculus* (shoot, sucker) and *-osa* (abundant) which alludes to the tendency of this plant to profusely sucker from the stems. This suckering could be due to damage from irregular flooding in the habitat.

Excluded species

1. *Dissiliaria tricornis* Benth., Fl. Austral. 6: 91 (1873).

   This is *Choriceras tricorne* (Benth.) Airy Shaw.

2. *Dissiliaria* sp. RFK#25730 (Christophel & Hyland 1993: 102g; Hyland & Whiffin 1993, 2: 132).

   Dissiliaria sp. (Rex Range, G.Sankowsky 1075) (Forster 1994).

   This was described as *Sankowskya stipularis* P.I.Forst. (Forster 1995).

Acknowledgements

The illustrations were drawn by W.Smith (BRI) with partial funding from the Australian Biological Resources Study (ABRS). Fieldwork and/or special collections were made with the assistance of A.R.Bean, D.G.Fell, D. & I.Liddle, P.Machin, G.Smyrell, G. & N.Sankowsky and M.C.Tucker. Photographs of material at BM and K were organised by P.S.Short (MEL) while Australian Botanical Liaison Officer (ABLO) at Kew (U.K.). Photographs of material at P were taken by G.P.Guymer (BRI) while ABLO at Kew (U.K.). The diagnoses were translated into Latin by L.A.Craven (CANB). Comments on a draft of the manuscript were provided by A.R.Bean (BRI). The Directors/Curators of the cited herbaria allowed access to collections either on loan or *in situ*. B. Hyland and staff at QRS provided support and access to facilities on repeated visits to north Queensland. Access to populations of *Dissiliaria* species in State Forests and Timber Reserves was facilitated by permits from the Queensland Forest Service, Department of Primary Industries. The work was funded as a preferred objective by ABRS during 1992–1994. Additional fieldwork in the 'Wet Tropics' region of north-east Queensland was possible due to a travel grant from the Wet Tropics Management Authority in 1993–1994 for work on Endangered Euphorbiaceae in that region.

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